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Taking our own medicine – on an experiment in science communication

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Abstract

In 2007 a social scientist and a designer created a spatial installation to communicate social science research about the regulation of emerging science and technology. The rationale behind the experiment was to improve scientific knowledge production by making the researcher sensitive to new forms of reactions and objections. Based on an account of the conceptual background to the installation and the way it was designed, the paper discusses the nature of the engagement enacted through the experiment. It is argued that experimentation is a crucial way of making social science about science communication and engagement more robust.

Taking our own medicine – on an experiment in science communication

"I saw a strange thing, when I passed through the shopping centre today. I was trying to get ideas for a birthday present for my brother, when I saw it. Right in the middle of the centre there was a curved row of large columns in many colours. At first, I thought it looked like something for kids, but the words printed on the columns put me in doubt: market, science, order, hierarchy... As I walked round it, I found an opening to the inside. At the entrance someone familiar was talking on a video screen and I recognised her as a weather presenter from TV. She was saying that it was an installation about public debate on science and technology. I became curious and went inside. When I was in, the columns looked different. The first one that caught my eye had a question at the top: "What is the role of science in society?" There were four different answers to choose from and you had to find them by turning a big cube. Each of the answers had a colour and you had to vote on one of them by putting a coloured bead into a transparent cylinder. I agreed with both the red and the blue answer, so I put two beads in. The next column had a pattern of black and white slates and it said one should write arguments on them. I didn't really have anything to write, but someone else had put "Give more money to Greenpeace" so I wrote "Shut down Greenpeace" underneath. Some of the columns were so big that you could actually go into them. I went inside the one that said "Control". You could switch on green or red lights depending on whom you wanted to be deciding about science and technology. I made it green for researchers, industry and politicians. I was not so sure about the citizens, because some people just really aren't very interested, but in the end I made that green as well. There were also two empty spaces, where people could suggest other groups. Someone had written 'kids' and I turned that to red, because I think that is just silly. After this I left. I still don't exactly know what the thing was supposed to do. I mean, people could just cheat with the votes so I doubt they can use it as a way of knowing what people think. On the other hand, I guess a thing like that might be good for some people, who aren't interested in these issues. And kids...."¹

The installation *Landscape of Expectations* was created in Spring 2007 as a collaboration between a spatial designer and a researcher. The installation was an experiment with social science communication designed to communicate research on public debate about science and emerging technologies in an interactive way. It was based on an earlier experiment and both have been documented at the website www.stamcellenetvaerket.dk

¹ This is not a quote from an actual person, but a compilation of observations and different experiences produced by the encounter with the installation discussed in the present paper.

(Horst & Dalsgaard, 2007). The creation of the installation was an attempt to improve scientific knowledge production by making the researcher sensitive to new forms of reactions and objections. This experiment presents an opportunity to reflect on the question of engagement: What, and how, do we learn from experimenting with spatial and dialogical research communication? What is the relationship between the theoretical ideals and the practical experiences of engagement?

Learning from objections

Internationally, the academic fields of Science Communication and Public Understanding of Science have presented a growing criticism of the traditional form of science communication (Gregory and Miller, 1998; Horst, 2003; Irwin and Wynne, 1996; Lewenstein, 2002; Michael, 1998). Traditional forms have been criticised for their foundation in a deficit model in which one-way communication from science is supposed to educate the lay public. On this basis, it has become commonplace to advocate a more dialogical form of research communication. This focus on dialogue has been stimulated by the growing number of public controversies over science and technology in recent decades (Hagendijk et al, 2005; Irwin, 2006; Joss, 1999; Rowe and Frewer, 2005). In many ways, Denmark is a particularly interesting context for these debates, due to its anti-authoritarian culture and long tradition of dialogue and citizen engagement – most widely known in the form of the consensus conferences organised by the Danish Board of Technology. However, as part of this academic community pointing to the need for dialogue and as an academic involved in Danish society, I have become increasingly aware that I, myself, predominantly use very monological forms of research communication. On this basis, creating the installation was motivated by a wish to experiment with taking my own medicine: How do I propose to communicate dialogically about my research?

However, the motivation behind the installation was not simply to practice what one preaches. Inspired by Bruno Latour and Isabelle Stengers, the experiment also represented an effort to use research communication as a way of improving research itself. According to Stengers, research is about asking questions (Stengers, 1997). What distinguishes good from bad research is that the former asks interesting questions, which allow the phenomenon under study to *object* – to demonstrate resistance – in a *relevant* way that teaches the researcher new things (Latour, 2000). In comparison with the natural sciences, however, social science suffers from the fact that it is very hard to get its objects of study to object. Natural scientists have the laboratory – a powerful technology, which allows them to ask questions under controlled circumstances. But what kind of technologies of questioning do social scientists possess? Natural scientists are indeed fortunate that their objects have no scruples about telling them they are on the wrong track:

If microbes, electrons, rock seams, do not have to be protected against biasing the experiments, it is not because they are fully mastered by their scientists, but because they are utterly *uninterested* in what human scientists have to say about them. It does not mean that they are 'mere objects', but that, on the contrary, they will have no scruples whatsoever in objecting to the scientist's claim by behaving in the most undisciplined ways, blocking the experiments, disappearing from view, dying, refusing to replicate, or exploding the laboratory to pieces. Natural objects are naturally recalcitrant (...) If many more precautions have to be taken with human subjects, it is (...) because they would quickly lose their recalcitrance by *complying* with what scientists expect of them (Latour, 2000 - p.116).

The big challenge for social scientists is therefore to create "objects which have been rendered 'able' (...) to *object* to what is told about them" in a manner that teaches something important (Latour, 2000:115). One difficulty in this task is the compliance of research objects. Another is the fact that the medium of research is often restricted to language. Language can be flexible and it is often difficult to create sensitivity to resistance. Exploding laboratories and deceased objects of study usually appear more spectacular than different usages of words. The importance of finding ways of *rendering objects able to object* in a significant way has been a crucial influence on the creation of the installation described in this paper. The simple assumption behind the installation was that the use of traditional means of research communication allows for certain kinds of objections, and that an expansion of media to other forms than language would render other forms of objections possible.

This expansion is particularly relevant at a time when the social contract between science and society is being renegotiated. If knowledge is to have effects, it is no longer adequate simply for it to be true: it must also be socially acceptable and robust (Irwin, 1995; Nowotny et al., 2001). However, it is important that the demand for social robustness should not be understood as a unidirectional claim that science should unequivocally adapt to what is deemed socially acceptable. Social robustness should not be seen as a static boundary between desired and undesired science, to which researchers should simply adhere. Rather social robustness is the goal of a process of negotiation. For any type of knowledge production it should be an open question whether the process of production generates acceptability. This is why the idea of resistance and objection is interesting. It suggests that knowledge will be better and more effective, the more it has met and dealt with objections. Researchers who want to make their research more robust should therefore try to challenge their knowledge and production methods as much as possible.

This argument challenges the traditional view of science communication as an activity which in time and place comes after the production of knowledge. Rather, research

communication should be embedded in the knowledge production itself and aimed at generating as much relevant resistance as possible. The intention of the experiment reported in this paper has therefore been to create a form of communication that allows non-experts to engage in dialogue on their own terms as part of the knowledge production itself. In this manner, the installation was conceived as a social scientific laboratory that could make researchers sensitive to unfamiliar forms of objections, with the possibility of learning something new.

In order to expand the medium for research communication beyond language, the experiment was designed as a spatial installation. The idea of spatial communication has been developed by Birte Dalsgaard, who argues that designers should create spaces, which do something else than the traditional flat and static modernistic space (Dalsgaard, 2007). Modernistic space dictates experience as visual in nature, since it focuses on visual frames and speaks to its visitors as if they were only eyes and intellect. Instead of this modernistic space, designers should create spaces that also emphasize the physically sensing body and emotional life. The space should not just speak to our eyes or intellect, but also to tactile and kinaesthetic sensations. Dalsgaard argues that a sensory experience is stronger than a purely visual one and that although a visual experience is often faster, it is also more quickly forgotten.

A parallel to these ideas can be found in innovation practices, where it seems that physical prototypes become increasingly more important in creative processes. It might be possible that experiences created through spatial and kinaesthetic influences supplement the more cognitive elements in ways not yet fully understood. What matters most in the present case is that spatial design and physicality enable a greater spectrum of communicative influences. This allows a different kind of openness, because it facilitates open-ended statements, which are completed by the visitor. It makes it possible to design a number of questions and theses, while allowing visitors to draw their own conclusions and interpretations.

Against this background, the core of the experiment with the *Landscape of Expectations* was an attempt to translate language-based social science into an installation that uses as much spatial communication and as little text as possible in order to communicate social scientific research on public debate about science and emerging technologies in Denmark (Horst, 2003; Horst, 2005; Horst, 2007; Horst, 2008; Horst, 2010). Inspired by Actor-Network-Theory (Latour, 1987; Latour, 1999; Law, 1986; Law and Hassard, 1999) the central message of the communicated research was that technologies do not fall from the sky as ready-made entities but are shaped in social processes where resources and legitimacy make a difference in terms of making some things easier and other things more difficult. In order to communicate this message, the installation was designed to demonstrate different arguments and attitudes in space, text, and visual images, as well as inviting visitors to interact in numerous ways in order to share opinions and reflections. The

idea was to tempt visitors to be transformed from spectator to participant by making them interact and leave traces for the next visitors to see. Visitors should be invited to become co-creators of the installation, because their interactions would alter its layout and content.

Based upon the claims of Stengers and Latour, however, the focus of this paper is not primarily on what the visitors of the installation learned from meeting the installation, but rather how the experiment can feed back into knowledge production. Specifically, the focus is directed back at the social science itself: What is learned by the social scientists through the performance of the experiment?

The installation

The basic structure of the installation consisted of 21 big, wooden boxes placed in a spiral form that circled once and left an opening for visitors to enter. The boxes were between ½-2 m² in area and 2-2½ m high (See Figure 1). The outside of the row of boxes created an exterior which had been designed to tempt by-passers to engage with the installation through the stimulation of curiosity, provocation, or other emotions. The inside of the installation was designed as an interactive questionnaire, where visitors could engage with the installation in various ways.

[Insert photo around here]

Based on research about public debate in Denmark, the installation was designed to illustrate public discourse on emerging science and technology. The point of departure was research conducted on mass mediated public debate about biotechnology in Denmark 1997-2001 (Horst, 2003). In this research, the cultural typology of Mary Douglas was found useful as a heuristic for classifying arguments about the role of science and biotechnology in society. The classification lead to identification of four different types of argumentation, or discourses, about science and technology in Denmark (see also Douglas, 1996; Douglas and Wildavsky, 1983). Two of these discourses were generally positive toward the beneficial contribution of science to society (called “Hierarchy” and “Market”), whereas the other two were negative (called “the Sect” and “the Islands”).

The exterior of the installation was designed to represent these different types of argumentation with various types of image and statement. The discourse “Hierarchy” for instance, represented a type of argumentation in which the expectation is that science will produce the truth and solve all problems, if it is just left to follow its own internal rules for rigorous scientific knowledge production. In the installation, the display of this argumentation was blue and consisted of laboratory pictures and a systematic display of words like: order, theory, systematic, expert, control, truth, category, method. In contrast the discourse of “Sect” represented a type of argument which understands science (and capitalism) to be destroying humanism and colonising the true community of people, so

that the central issue is to make people aware that what looks like progress really is degradation and corruption. In the installation, the display of this type of argumentation was white and green with pictures in two layers. The top layer was a naturalistic painting and cropped so that visitors could see the underlying layer, which was a robotic, technical or Guernica-like version of the same motif. These paintings were combined with dichotomies of words in black and white such as good-bad, money-moral, participation-power, progress-relapse.

The interactive interior consisted of a number of different elements which were designed to invite visitors to take part in the public debate over the role of science and technology in society. The intention behind this participation was to let visitors *perform the message* of the installation: that the shaping of emerging science and technology takes place in a social setting, where creation of public acceptance and distribution of resources make a difference for which type of technology it is possible to create. The different elements of the interior were therefore designed to be interactive and in combination to illustrate the social shaping process.

Each of the wooden boxes that made up the installation displayed one of the interactive elements. Some boxes presented visitors with questions, such as: What is the role of science in shaping future society? How should we spend societal resources? Each question had some predefined answers and different ways for visitors to indicate physically what they thought were the best responses. Often visitors were able to add different answers. They could also choose to have their answers registered by putting voting beads in plastic cylinders.

Next to the boxes with questions, visitors could choose to search for more information in *knowledge boxes* by looking through little periscopes. Several of these periscopes were placed so that visitors had to stretch or bend to reach them, thereby symbolising the perception that knowledge is not always so easy to acquire. Some boxes consisted of many small slates where visitors could write their own statements as well as read and cover and uncover other visitor statements. There were also a couple of boxes where the focus was on individual reflections. One was about expectations of the future. Visitors could go into this box, where two walls consisted of mirrors covered with transparent images of artifacts, events and faces, which symbolized either hope (on one wall) or fear (on the other wall). The light was changing in the box, which meant that visitors would alternately experience either their own reflection or the hope-fear images more clearly. At the adjoining box, visitors were asked to write their hopes on green notes and their fears on red notes and hang them on a set of strings for others to see.

In the middle of the installation there was a large round feature, where visitors could choose to participate in the building of different structures with different sets of blocks designed to correspond to the four forms of discourse displayed on the exterior. The

Hierarchy building-blocks were square wooden blocks in many blue shades held together by wooden pegs in a very tight square structure. The blocks symbolizing the Sect discourse were a round shape in different pastel shades of green, rose, peach, purple and blue held together by elastic bands, which meant that they very easily became quite entangled. Visitors were left to draw their own conclusions from this section as there was no explanation. However, in other parts of the installation the building-blocks were physically part of the display of the four different discourses so connections could be found if visitors were looking for them.

Through the different interactive elements, the installation displayed an argumentative landscape and invited visitors to participate actively in the debate. The changing appearance illustrated how the landscape of public debate is constantly shaped through citizen participation. The installation, therefore, was designed to solicit reflection and opinion formation within the individual while simultaneously making the social setting of this process visible.

It is important that the four types of argumentation displayed on the outside were brought into play in the interactive interior, for instance with the four sets of building blocks. Additionally, several of the pre-defined answers in the interactive questionnaire were inspired by the four different types of discourse. But there was no fixed or straightforward connection between answers to questions, building blocks, and arguments. For instance, some of the building blocks could be connected in a way that mixed the four forms, just as it was not possible to refer all the pre-defined answers back to each of the four discourses. Within certain frames visitors were therefore free to associate different elements as they wished. This illustrated two important points from the social science in which the installation has its departure. First of all, as citizens we are free to form our own opinions, but we always do this in a social context, which defines some boundaries for what it is possible to connect in a meaningful way. Second, the four discourses are not as separate as the first description portrays them. In the embedded social scientific research they are understood as interpretative resources and argumentative frameworks, but not as a tool for categorising actual people.

On a basic level, the installation was designed to make people *experience*, rather than understand, the social science embedded in the installation. It was not important whether visitors left the installation with a clear understanding of the social scientific knowledge base. The success criterion was whether or not people engaged, because the act of engaging was, in a crucial sense, the message. It was therefore *in the experience of engaging that visitors performed the message* of the installation. Visitors needed not necessarily understand the totality of the installation, nor did they need to identify with any of the four argumentative discourses. All statements and questions were meant as invitations to dialogue, not as a list of facts to be understood.

Engaging whom?

The installation was created in the spring of 2007 to be displayed in public for the first time in April 2007 at the Danish Festival of Research, which is a national event organised by the Danish Ministry for Science, Technology and Innovation. It was later exhibited for two days in a shopping centre in Copenhagen and at three academic seminars. In all exhibitions visitors became engaged and interacted with the installation in various ways.

The experiences of visitors are one obvious way of understanding the results of the installation. In the context of this paper, however, I want to discuss the notion of engagement in a slightly different way and interpret the results on a broader level inspired by the previous focus on *objections*. The installation has produced many types of reactions and many of its effects are primarily felt by its creators. These effects touch upon the general relationship between research institutions and society, the activity of doing research and the general roles of researcher (and designer). To discuss results in this way, it is important to begin with the process of creating the installation.

In the effort to create new and different media for this communication, “translation” has been a key concept (Latour, 1987). In the particular social scientific use of this concept, the crucial point about translation is that a shift from one medium to another is productive, because it will always create different or additional meanings. Creating the installation was therefore understood as the invention of new meaning, which could not simply be deduced from the input by research and design. The designer and researcher bring different forms of knowledge and practice to the process, but the creative process is to make these different forms interact in order to produce something new. This is not to say that the installation was created simply for the sake of creation², but rather that creation was not a trivial matter or one of simply representing knowledge in a different way.

Through an earlier experiment with spatial communication in 2005 the designer had developed a work method of using different visual brainstorming tools in order to solicit usable social scientific research points, which were simple enough to be spatially communicated. The process of cutting to these research points requires extremely close collaboration between designer and researcher. In fact, the roles become so closely interwoven that it would make sense to speak of hybrids as researcher-designer and designer-researcher. Both hybrids have to come up with ideas for the material expression, and they also both ask questions to check the relationship with the social scientific knowledge base: What is the nature of this relationship? What are the limits to mutability and translation of the social science? What does this physical shape imply for the interpretation of social science and vice versa?

² Although, if we had conceived of ourselves as artists, we might have thought about this point differently.

In the conceptual process the creative ideas had to be matched with time constraints as well as the budgetary and physical frames for the project. It was important, however, that these constraints were not just seen as regrettable cuts to otherwise complete concepts. Instead, we chose to understand the limitations to our creative possibilities as an integrated part of the task. It would not be viable for us as designer-researchers to excuse a poor result with a lack of resources. The challenge of staying within limitations to resources is comparable to the challenge of translating complex research-based knowledge into spatial concepts. The test is to negotiate between practical possibilities in order to explore what will work, how, and in which circumstances. This is not a process which can be split into research and design, but an integrated process in which both aspects are learned at the same time.

In this way practical and material restraints can be seen as a productive force for asking the fundamental question: Can the complexity of this social science be translated into a meaningful spatial concept? The answer to this question is not theoretical or general. Rather the question is answered specifically and empirically through the experiment of physically creating the installation and explaining its design in a meaningful way. Several colleagues have suggested that this is a trivial response to the original question. They often add that the central success criterion for the installation, i.e., whether it succeeded in getting people to interact, was also quite unimpressive. These remarks, however, must be viewed as hindsight comments. Using the example of Pasteur's creation of the lactic acid bacterium, Latour has described how it is common to think a fact was always there, once it has been produced (Latour, 1999). But thereby the productive work that was put into making it part of the world is downplayed. Looking backwards, inventions or other results of experiments seem a lot more straightforward than they did when their creators faced the original problem, task or idea.

The point here is not that creating the installation was a heroic act of invention against all odds, but just that it was an experiment, however small, which could have failed in many different ways. It was designed to be put in a public space in order to invite random by-passers to be transformed into active participants. The possibility of failing this objective was present in discussions throughout the creation of the installation, although as its creators we tend to forget this, now that we believe it succeeded. This is an important point for social scientists analysing various participatory exercises in science policy. Any exercise looks different in hindsight, when one knows the empirical outcomes of all the initial insecurities and unknowns. The importance of this simple insight was reinforced by the fact that I have been embraced by Danish science communicators in a new fashion after conducting the installation experiment [cf Hackett and Rhoten 2011]. As one of them commented: "You are not like the other social scientists, because you actually **do** things yourself". This new acceptance seems to relate to the sense of sharing the experience of fragility and putting oneself at risk of failure.

In the process of exhibiting the installation, a great number of elements have turned out differently from what we expected and in the context of this paper some of these constitute important learning points. Three issues are particularly important in terms of the notion of *learning from objections* introduced previously.

The first learning point occurred when a colleague, who had listened to a presentation about both the first and the second experiment, compared the two installations and found that the second installation embodied a lot fewer emotional appeals than the previous one. In reflection there might be at least three important causes. First, the former installation was based on a different knowledge base, including a substantial amount of anthropology, where individual experiences featured more prominently. In comparison, the second installation was built on research about public debate, where the knowledge base was configured in a more general and abstract way. Second, this observation might indicate something about the basic attitudes toward public debate. Neither the researcher nor the designer has a passionate relationship to participation in public debate. It might be that if we had felt more strongly about the need for increasing democratic participation in public debate, we would have found it easier to make the installation more emotionally challenging. Third, despite the explicit intention to appeal to emotions, we might subconsciously have been a bit cautious about their communicative power due to an experience with the former installation about the acceptability of embryonic stem cell research. Although we tried hard to balance different opinions on this topic, visitors later said they thought we were in favour of allowing embryonic stem cell research. Reflecting on this, we concluded that it was probably due to a very successful interactive element where visitors were asked to imagine themselves as incurably ill and hoping for cures produced by stem cell research. In hindsight, this experience might have made us a little more cautious about using emotions, because they seem so hard to dose satisfactorily.

The second point of learning derives from another colleague pointing out that the installation seemed to be guided by a focus on how publics shape and react to technologies presented to them. An alternative focus on how technologies are created as a reaction to a demand could probably have been built into the installation, but was not. Reflecting on this, it seems that the social scientific research on which the installation was based probably does have an inbuilt (and perhaps unwise) bias toward a technology-push perspective - that is, a perspective which centres on how technology drives social change. As such, the materialisation of research into a physical expression has the possibility of teaching the researcher about implicit assumptions that might not have been realised previously.

The third point relates to the first couple of test-exhibitions, where visitors were very quick to ask for further explanation of the elements, if they did not understand the embedded social scientific knowledge base. This was an important lesson about expectations toward the installation as a communicative product. Visitors expected to be presented with

something they could recognise as “facts”, when they engaged with something called “research communication”. In order for the installation to work as intended and to make visitors *perform and experience the message*, it was renamed a “debate installation”. The term “installation” shaped expectations toward art, which meant that visitors to a lesser degree were expected to “be told” and to a larger degree were prepared “to experience” and to apply their own interpretations. This outcome, however, is interesting in light of the general impression of Denmark as an anti-authoritarian culture (Jespersen, 2004). Is there something about expectations of science communication that is relatively authoritative?

The last of these learning points also explicates an inherent tension between the objectives of the installation. On the one hand, the installation was conceived as an installation of research communication, which meant that the obvious success criterion was whether visitors could make sense of the research communicated. This criterion led to a focus on effective strategic communication: How can one best design the installation in order to enable visitors to decode the messages? On the other hand, the installation was created through an explicit wish to stimulate dialogue and engagement, and should therefore allow for multiple interpretations, broad framings of problems and solutions, and inclusive models of communication. It therefore seemed that the guiding question should be: How can one make the installation as interpretatively open as possible?

Through the work with the installation, however, it has become increasingly clear that there need not be a tension between these two objectives, because the interpretative openness and inclusion should not primarily be found in the design of the installation and its messages. Rather, this was a question about the use of the installation and the understanding of the role of the visitors. In fact, since the aim was to solicit reactions and objections, it was necessary that the installation contain certain specific messages to which visitors were able to object. While creating the installation it was therefore necessary to think as strategic communicators about how to embody a message in a spatial design. Subsequently, the interpretative flexibility and the sensitivity to objections became central to the way the installation was exhibited.

The paradigmatic challenge of this openness to the ways in which visitors could receive the installation was the two-day exhibition in a shopping centre outside Copenhagen in September 2007. The installation was placed in the middle of the centre, but, apart from the short introduction on the video screen, potential visitors were left to make sense of it on their own. The installation was under observation, but we were not visible in the centre as custodians or information personnel. The intention of this exhibition was to see how potential visitors would react if there were no personal mediation or introduction between them and the installation. This exhibition was therefore a real experiment designed to test whether the basic success criterion, transforming random passers-by into engaged participants, could be met. The paradigmatic nature of this test was reinforced by the fact

that the installation primarily addressed visitors as citizens and not as consumers, and it was therefore interesting to see how this would work out in the shopping centre setting.

An integral part of the installation was surveillance cameras and we are in the process of analysing engagement patterns more closely from these tapes³. From initial observations in the shopping centre, it is apparent that during the total of 10 hours of exhibition, approximately 250 people engaged with the installation. Their interaction ranged from listening to the video presentation to spending more than 20 minutes inside the installation engaging with a number of interactive elements. Approximately a third of these 250 visitors were children followed by a parent. Whereas some of the parents would subsequently either wait for their children to finish or choose to participate together with their children, other parents would leave the children to themselves in order to concentrate on the installation. Young men were, perhaps surprisingly, a frequent category of visitors. Many were on their own in the shopping centre and it looked like they were attracted by the technological side of the installation – the video screen and the feed from the surveillance camera to an outside screen. Many of them, however, spent quite a long time interacting with the non-technological elements inside the installation.

Within the context of this paper it is not possible to evaluate all the ways people became participants, but a few examples can illustrate how people *performed the message of the installation*. In the control room, where visitors were asked to indicate whether they thought Researchers, Politicians, Industry and/or Citizens should be part of the decision-making process regarding the regulation of science and technology, there was an interesting example of alternative use of the voting system. At some point, a visitor had taken all the voting beads from the Industry-cylinder and put them in the Politicians-cylinder. Originally, an electronic voting system was planned as part of the design. This should allow visitors to see how others had voted without being able to interfere with their votes. In this way, the voting system could have served as an interactive polling instrument. Due to resource restrictions the electronic system was not possible and this meant that it became very easy to interfere with other peoples votes, because they were just beads in a plastic cylinder. However, by this choice, the element of voting was reconfigured from a polling system to a communicative tool. The idea of having people vote was to make them reflect on what a vote is and how it relates to other votes. The interesting thing, then, is actually not that one visitor distorted the results, but that not everyone did the same. Apparently most Danes automatically behave according to the one-person-one-vote principle.

³ This method was chosen because it did not disturb the experiment of testing the installation without mediation. Denmark does not have a requirement or even tradition for Institutional Review Board approval of social science. To obtain informed consent would have ruined the experiment, but visitors were clearly warned that they would be videotaped for research purposes by a large sign at the entrance to the installation.

There were a number of observations which might be interpreted as visitors "not understanding the idea of the installation". For instance, a number of teenagers were primarily attracted by the surveillance camera which fed directly to a screen on the outside of the installation. Several teenage girls also used the slates to write the names of their loved ones, and when asked to write their hopes and fears for the future they left comments about the fear of shopping centres closing. These experiences, however, should not be interpreted as mistakes or communication gone wrong (Horst and Michael, 2011). Rather, they test the ability of the designer-researchers to learn from their experiments by raising questions: How are visitors allowed to react? What do the social scientist interpret as reactions? At a basic level these reactions can be interpreted as saying that, to people in a shopping centre on a Saturday morning, lovers, shopping centres, and their own appearance on a TV screen are much more important than democratic control over science and emerging technology. This form of resistance should be taken seriously, although, depending on the researcher, it can prompt different reactions. One interpretation and response, shared by many people involved in science communication, is to try harder in order to "get the message across". Another is to accept that citizens will have different interests and that it might not be possible, desirable, or even necessary, to engage all members of a population in science communication – or alternatively, that people might have more ways of becoming scientific citizens (Irwin, 2001) than imagined by the community of research communication.

Conclusions

It will have been obvious from the previous discussion that the installation produced engagement in a number of ways and that the process of reflecting on its effects is on-going. However, the two overall success criteria for the experiment have been met. The installation was created and it transformed some of the random passers-by into participants. However trivial these criteria might seem now, the risk of failure was present throughout the process. It is on this basis that the installation should be understood as an experiment in Stengers' sense. Rather than take the translation of Saturday morning shoppers into installation-participants for granted (now that it has happened) we must acknowledge that it might not have been the case. This also goes for similar engagement initiatives (e.g., Schuurbiers 2011, Selin 2011, van Oudheusden 2011): as researchers, we cannot take engagement for granted. Rather, we must understand each specific case in terms of what was learned – both on behalf of the groups engaged, but also on behalf of the research communicators and the involved community of scientists.

Following Stengers, one can say that the more risky a research experiment is, the more a researcher stands to learn. According to this principle, social scientists working with science and research communication should innovate and try new forms, media, concepts and contents for research communication. Not only would such experiments make

research communication more interesting, they also offer the possibility of learning about engagement as well as the robustness of the science communicated.

This paper presents some important lessons learned in connection with the installation, but one fundamental point has only been mentioned indirectly. When the project was originally funded, we assumed that we were going to test the installation in focus group reception studies. During the work with the installation, this objective has been postponed on several occasions. This is partly due to time constraints, but also to a profound difficulty in measuring these types of effects. Throughout work with spatial research communication, we have experienced more compliance than we hoped for in our attempts to interview people about their experiences with the installations. They often deferred to what they took to be our point of view on the questions and gave us the answers they thought we were looking for. Furthermore, the interview setting meant that the physical experiences had to be transformed into linguistic statements, which tended to defeat the criterion of *experiencing rather than cognitively understanding* the message of the installation. Of course these obstacles can be reduced by development of suitable methods, but on a basic level they point to a fundamental question in research communication: Does research communication only work if one can prove its effects with social scientific methods? And following this, what does one mean by saying that research communication “works”?

In a broader setting, it is interesting to reflect on the changes in the relationship between science and society, which means that an experiment of this type can be carried out within the classic framework of a university. Although several colleagues have made joking remarks about the nature of the installation, the general experience has been one of institutional and collegial support. The experiment did not take place without serious consideration of boundaries (Gieryn, 1995) at the Copenhagen Business School where it was created: Does study of research communication(?) count as research, and how will it be evaluated and registered as such?

In this context, it is probably not important whether the experiment counts as research, but rather that it symbolises the need to invent and shape new relations in which things come together to make innovations. In this context, the element of play in the design as well as the exhibition of the installation was important. It was extremely entertaining to create the installation, just as it was a positive experience to see children and adults engaging with it, despite, or perhaps because of, its colourful appearance, which signalled to them a playground rather than serious factual information.

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Figure 1: *The installation exhibited in the shopping centre outside Copenhagen. It is clear that we did not consider that audiences might see it from above when we designed it.*

